

REMARKS

I. Preliminary Matters

Claims 1-9, 14-17, 22-25 and 28-38 are pending, claims 34-38 are withdrawn from consideration as being directed to a non-elected invention, and claims 1-9, 14-17, 22-25 and 28-33 are rejected.

Applicants respectfully request the Examiner acknowledge the claim to domestic priority to provisional Application No. 60/121,436, and affirm the election of Group I, claims 1-9, 14-17, 22-25 and 28-33 for prosecution, without traverse.

The amendments to claims 1-4 and 7 find support, for example, bridging pages 18-19 of the specification. New claim 39 finds support, for example, by reference to Examples 3, 4, 5 and 6 of Table 1 at page 45 of the specification.

Withdrawn claims 34 to 38 are directed to a method for manufacturing the carbon material for a lithium battery as claimed in claims 1, 2, 3, 4 and 7, respectively. If the product claims are allowable, then Applicants respectfully request rejoinder of the withdrawn method claims which include all of the limitations of the corresponding product claims pursuant to MPEP § 821.04.

II. Statement of Substance of Interview

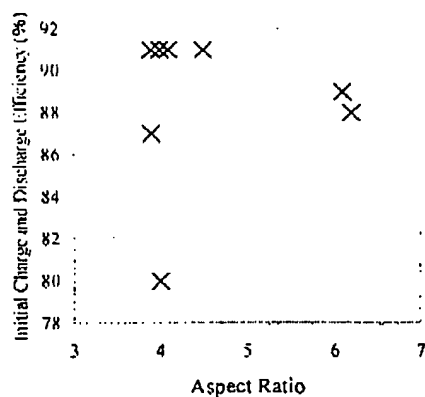
In the interview of April 29, 2004, Applicants' representative discussed the prior art references, and possible amendment/arguments in response to the rejection, including the Examiner's position that it would be expected that the powder of Hase et al. possesses an oxidation initiation temperature within the claimed range. Particularly, the Examiner considered

that the prior art graphite powder which is said to be similar to the carbon material, would necessarily exhibit the same properties even if such properties are not explicitly disclosed. Applicants' representative discussed how powder having some of the claimed characteristics would not necessarily possess all the claimed properties of the present invention. In this regard, Applicants' representative pointed to Examples 1 and 2 of the present specification as showing that even if the aspect ratio and the specific surface area are not within the claimed range, an oxidation initiation temperature of 600°C or more was not observed. The point was made that even if powder of Hase et al. possesses some of the claimed characteristics, the powder would not necessarily possess the claimed properties, such as the claimed oxidation initiation temperature. The Examiner advised that even though Examples 1 and 2 may not possess all the claimed properties, unless Applicants show that the powder of Hase et al. does not necessarily possess all the claimed properties of the present invention, the rejection would be maintained.

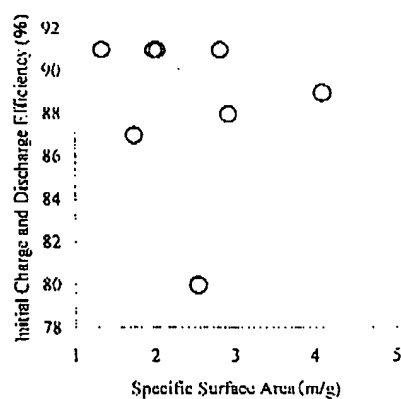
Applicants' representative also discussed Graphs 1 and 2 below, showing that activity of the graphite powder is unrelated to the specific surface area, aspect ratio and bulk density. This data was taken from Table 1 at page 45 of the specification. Applicants' representative also presented Graph 3 showing oxidation initiation temperature as a function of initial charge and discharge efficiency, also from Table 1. Graph 3 shows that a higher oxidation initiation temperature results in higher initial charge and discharge efficiency. In response, the Examiner pointed to page 16, lines 1-4 of the present specification, as indicating that the oxidation initiation temperature correlates not only with chemical activity of the graphite powder, but also with the shape of the powder, the specific surface area, or the like. Based thereon, the Examiner

maintained his position that one of ordinary skill in the art would expect the powder of Hase et al. to have an oxidation initiation temperature of 600°C or more.

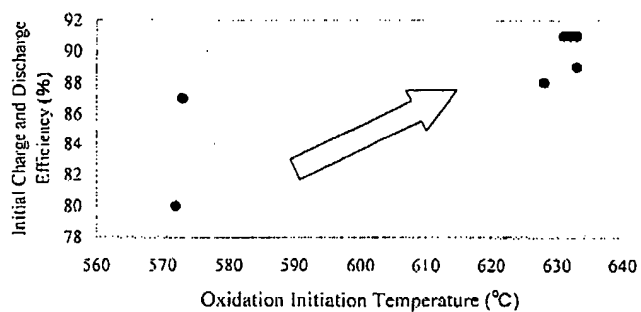
Graph 1



Graph 2



Graph 3



III. Rejection Under 35 U.S.C. § 102(e)

Claims 1-9, 14-17, and 30-33 were rejected under 35 U.S.C. 102(e) as anticipated by Hase et al. (USPN 5,910,383). The grounds for rejection remain the same as set forth in the previous Office Action.

The Examiner cited the powder of Example 1 of Hase et al. which contains *less than 3* wt% of particles of 2 μm and smaller as overlapping the claimed range. Additionally, because the prior art product is said to be similar to the claimed carbon material, the Examiner considered that the product of Hase et al. would inherently meet the claimed physical properties.

Applicants traverse, and respectfully request the Examiner to reconsider in view of the amendment to the claims and the following remarks.

As acknowledged in the Office Action dated February 25, 2004, Hase et al. does not explicitly teach or disclose a single example of a particle mixture containing 1 wt% or less of particles having a particle size of 3 μm or less. To the contrary, in Example 1 of Hase et al., the fine powder thus obtained was free of particles of 48 μm or greater in particle size, contained fine particles of 2 μm and smaller in particle size in a proportion not greater than 3 wt%, and had an average particle size of 16 μm (column 7, lines 45 to 50). From this description, it is clear that the graphite powder of Hase et al. did contain fine particles of 2 μm or less in particle size. This is reasonably understood since the steps for removal of fine particles, such as clarification was not conducted in Example 1 of Hase et al.

In view of the above, it is respectfully submitted that the rejection based on anticipation cannot stand, because there is no single specific example in Hase et al. of a graphite powder meeting each of the limitations of the rejected claims. Moreover, it is respectfully submitted that

the Examiner has not set forth a sufficient rationale or evidence tending to show inherency as required by MPEP § 2112. To the contrary, Applicants have provided good and sound reasons as to why one of ordinary skill would consider that the graphite powder of Hase et al. does not meet the terms of the present claims. Moreover, as to the underlying rejection under 35 U.S.C. § 103(a), the Examiner has not pointed out anything in the prior art which teaches or suggests the desirability of modifying the graphite powder of Hase et al. to have a content of particles having a particle size of $3\text{ }\mu\text{m}$ or less of 1 % by weight or less and a content of particles having a particle size of $53\text{ }\mu\text{m}$ or more of 1 % by weight or less as required by the present claims.

For the above reasons alone, it is respectfully submitted that the rejected claims are patentable over Hase et al.

To further distinguish over Hase et al., claims 1, 2, 3, 4 and 7 have been amended to recite that the graphite powder has a Co value of less than $6.720\text{ }\text{\AA}$. Support is found, for example, at page 18, line 25 to page 19, line 2. This limitation of the present claims, the significance of which is discussed in further detail below, is neither taught nor suggested by the prior art. For example, the graphite powder prepared in Example 1 of Hase et al. had a crystal lattice constant Co of $6.73\text{ }\text{\AA}$ outside the scope of the amended claims.

For the above reasons, it is respectfully submitted that claims 1-9 and 30-33 are not anticipated by Hase et al., and withdrawal of the foregoing rejection is respectfully requested.

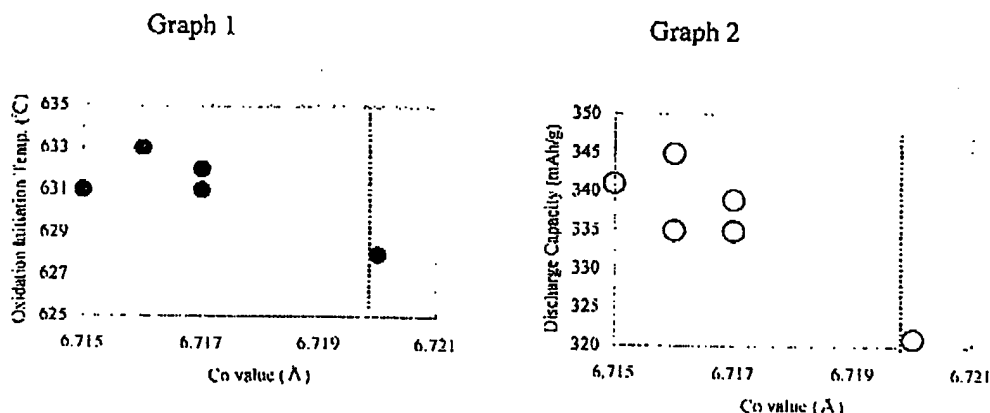
IV. Rejection of Claims 1-9, 14-17 and 30-33 under 35 U.S.C. § 103(a)

Claims 1-9, 14-17, and 30-33 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al., either alone or in view of Ozaki et al. (US 5,344,724).

The Examiner relied on Hase et al. as discussed above. Ozaki et al. was cited as teaching that particles having a size of less than 3 μm are undesirable in a graphite powder for use in a lithium battery negative electrode.

Applicants traverse, and respectfully request the Examiner to reconsider for the following reasons.

Claims 1 to 4 and 7 have been amended to recite a Co value of less than 6.720 Å. Particularly, the present application discloses that the lattice constant Co of the graphite structure is still more preferably 6.720 Å or less. More particularly, the present specification discloses that by improving the crystallinity of the graphite powder, meaning a smaller Co value, the charge and discharge capacity of a battery can be increased, and the specific electrical resistance can be decreased. See page 19, lines 2-5 of the specification. Further in this regard, the results of the Examples 1 and 2 are shown in Graphs 1 and 2 below.



It is clear from these graphs that the lattice spacing (Co value) has an effect on the oxidation initiation temperature and the discharge capacity. Furthermore, it is clear that a lower

Co value, lower than 6.720 Å, indicates a better oxidation initiation temperature and a better discharge capacity in the battery.

Hase et al. describes a crystal lattice constant Co of 6.73 Å at column 7, line 65. Ozaki et al. describes a lattice plane spacing of 3.36 to 3.39 Å. See the Abstract of Ozaki et al. This lattice plane spacing is one-half of the Co value and is understood to be equivalent to 6.72 to 6.78 Å. The present claims limit the Co value to less than 6.720 Å, and the present specification explains the significance and effect of a smaller Co value. On the other hand, Ozaki et al. simply measured the lattice plane spacing of the powder and did not notice or recognize the effect or relationship between the lattice plane spacing and the discharge capacity of the battery or on the oxidation initiation temperature.

For the above reasons, it is respectfully submitted that claims 1-9 and 30-33 are patentable over Hase et al., either alone or in view of Ozaki et al., and withdrawal of the foregoing rejections under 35 U.S.C. § 103(a) is respectfully requested.

V. Rejection of claims 22-25 under 35 U.S.C. § 103(a)

Claims 22-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. as applied above and further taken with admitted prior art (JP-A-8-31422). In addition, the claims were rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. in view of Ozaki et al. and further taken with admitted prior art (JP-A-8-31422).

JP-A-8-31422 was cited as disclosing addition of boron to carbon powder and graphitizing the mixed powder.

Applicants rely on the response above with respect to the rejection over Hase et al. and Ozaki et al. JP '422 adds nothing of consequence which would adversely affect patentability of the present claims, and withdrawal of the foregoing rejections is respectfully requested.

VI. Rejection of claims 28-29 under 35 U.S.C. § 103(a)

Claims 28-29 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. as applied above and further in view of Yoneda et al. (USPN 5,591,547). In addition, the claims were rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. in view of Ozaki et al. as applied above and further in view of Yoneda et al. (USPN 5,591,547).

Yoneda et al. was cited as teaching polyvinylidene fluoride as a specific binding material for use with graphite particles in a lithium battery electrode (column 5, lines 1-20).

Applicants rely on the response above with respect to the rejection over Hase et al. and Ozaki et al., and withdrawal of the foregoing rejections under 35 U.S.C. § 103(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-9, 22-25 and 28-39 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No.: 09/807,075

Attorney Docket No.: Q53366

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

Keiko K. Takagi / by [signature] Reg. No. 33,276

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

Keiko K. Takagi
Registration No. 47,121

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

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